



400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

# AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 4062G

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Superseding AMS 4062F

ALUMINUM TUBING, SEAMLESS, DRAWN, ROUND  
(1100-H14)  
Strain Hardened

UNS A91100

## 1. SCOPE:

- 1.1 Form: This specification covers aluminum in the form of seamless, drawn, round tubing.
- 1.2 Application: Primarily for parts, such as brackets, conduits, and low-pressure lines, where good weldability and resistance to corrosion are required.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

- 2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

### 2.1.1 Aerospace Material Specifications:

- AMS 2203 - Tolerances, Aluminum Alloy Drawn Tubing  
MAM 2203 - Tolerances, Metric, Aluminum Alloy Drawn Tubing  
AMS 2350 - Standards and Test Methods  
AMS 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings  
MAM 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings, Metric (SI) Units

- 2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B660 - Packaging/Packing of Aluminum and Magnesium Products

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3. TECHNICAL REQUIREMENTS:

- 3.1 Composition: Shall conform to the following percentages by weight,  
 Ø determined in accordance with AMS 2355 or MAM 2355:

	min	max
Aluminum (by Difference)	99.00	--
Copper	0.05	- 0.20
Iron + Silicon	--	0.95
Zinc	--	0.10
Manganese	--	0.05
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15

- 3.2 Condition: Strain hardened.

- 3.3 Properties: The product shall conform to the following requirements:

- 3.3.1 Tensile Properties: Shall be as follows for tubing having nominal wall  
 Ø thickness of 0.014 - 0.500 inch (0.36 - 12.70 mm), incl, determined in  
 accordance with AMS 2355 or MAM 2355:

Tensile Strength, minimum	16,000 psi (110 MPa)
Yield Strength at 0.2% Offset, minimum	14,000 psi ( 97 MPa)

- 3.3.2 Flattening: Tubing having nominal wall thickness less than 10% of the  
 nominal OD shall withstand, without cracking, flattening sideways under a  
 load applied gradually at room temperature until the outside dimension  
 under load is equal to six times the nominal wall thickness.

- 3.3.2.1 If tubing does not pass the flattening test of 3.3.2, a section of tube  
 not less than 1/2 inch (12.7 mm) in length and embracing one-third to  
 one-half the circumference of the tube shall withstand, without  
 cracking, bending at room temperature through an angle of 180 degrees  
 around a diameter equal to four times the nominal wall thickness of the  
 tubing with axis of bend parallel to axis of tube and with inside of  
 tube on inside of bend.

- 3.3.3 Flarability: Tubing 0.375 inch (9.52 mm) and under in nominal OD shall withstand being double-flared and tubing over 0.375 inch (9.52 mm) in nominal OD shall withstand being single-flared without formation of cracks or other visible defects. The specimen shall, at room temperature, be forced axially with steady pressure over a hardened and polished tapered steel pin having a 74-degree included angle to produce a flare having the permanent expanded OD not less than specified in Table I.

TABLE I

Nominal OD Inches	Expanded OD Inches	Nominal OD Inches	Expanded OD Inches
0.125	0.200	1.000	1.187
0.188	0.302	1.250	1.500
0.250	0.359	1.500	1.721
0.312	0.421	1.750	2.106
0.375	0.484	2.000	2.356
0.500	0.656	2.500	2.856
0.625	0.781	3.000	3.356
0.750	0.937		

TABLE I (SI)

Nominal OD Millimetres	Expanded OD Millimetres	Nominal OD Millimetres	Expanded OD Millimetres
3.18	5.08	25.40	30.15
4.78	7.67	31.75	38.10
6.35	9.12	38.10	43.71
7.92	10.69	44.45	53.49
9.52	12.29	50.80	59.84
12.70	16.66	63.50	72.54
15.88	19.84	76.20	85.24
19.05	23.80		

- 3.3.3.1 Tubing with nominal OD between any two standard sizes given in 3.3.3 shall make the same percentage flare as shown for the larger of the two sizes.
- 3.3.3.2 Flarability requirements for tubing over 3.000 inches (76.20 mm) or under 0.125 inch (3.18 mm) in nominal OD shall be as agreed upon by purchaser and vendor.
- 3.4 Quality: Tubing, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the tubing.
- 3.5 Tolerances: Shall conform to all applicable requirements of AMS 2202 or MAM 2202.

#### 4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of tubing shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the tubing conforms to the requirements of this specification.

#### 4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for composition (3.1), tensile properties (3.3.1), and tolerances (3.5) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for flattening (3.3.2) and flarability (3.3.3) are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling: Shall be in accordance with AMS 2355 or MAM 2355 and the following:

4.3.1 Specimens for flarability test (3.3.3) shall be full tubes or sections cut from a tube. The end of the specimen to be flared shall be cut square, with the cut end smooth and free from burrs but, except for sizes 0.375 inch (9.52 mm) and under in nominal diameter, not rounded.

#### 4.4 Reports:

4.4.1 The vendor of tubing shall furnish with each shipment a report stating that the tubing conforms to the chemical composition and other technical requirements of this specification. This report shall include the purchase order number, AMS 4062G, lot number, size, and quantity.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 4062G, contractor or other direct supplier of tubing, part number, and quantity. When tubing for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of tubing to determine conformance to the requirements of this specification and shall include in the report either a statement that the tubing conforms or copies of laboratory reports showing the results of tests to determine conformance.

4.5 Resampling and Retesting: Shall be in accordance with AMS 2355 or MAM 2355.

#### 5. PREPARATION FOR DELIVERY:

5.1 Identification: Shall be as follows: